

SGP.18c

Specification

Part No.	SGP.1575.18.4.C.02
Product Name	GPS SMT Patch Antenna
Feature	18mm*18mm*4.5mm 1575MHz Centre Frequency Patent Pending RoHS Compliant

1. Introduction

This ceramic GPS patch antenna is based on smart **XtremeGain™** technology. It is mounted via SMT process and has been selected as optimal solution for the 45x45mm ground plane.

2. Specification

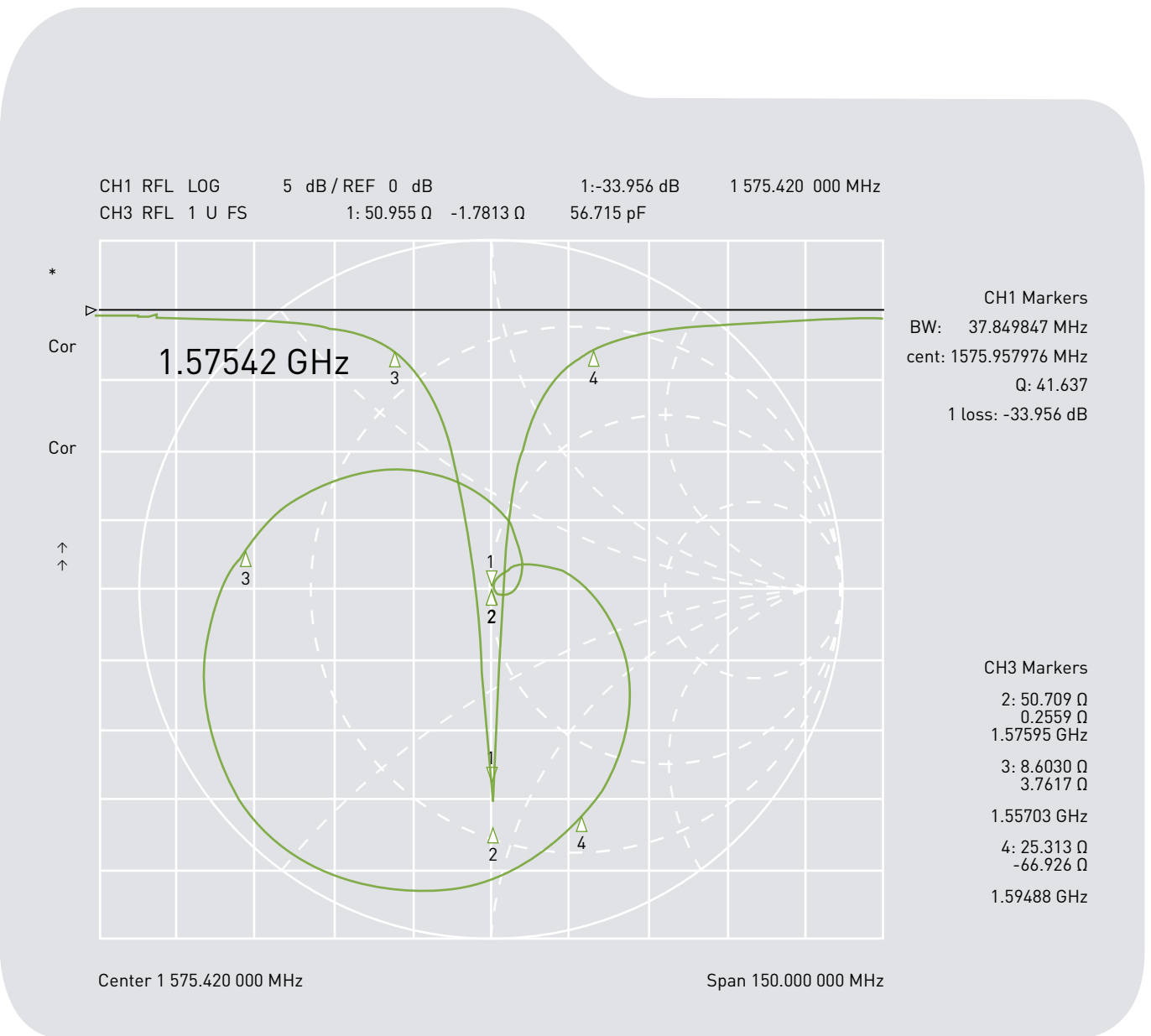
Original Patch Specification tested on 45mm ground plane

NO	PARAMETER	SPECIFICATION	NOTES
1	Range of Receiving Frequency	1575.42 MHz ± 1.023 MHz	
2	Center Frequency	1575.42 ± 3MHz	With 45*45mm Ground Plane
3	Bandwidth	5MHz min	Return Loss ≤-10 dB
4	VSWR	1.5 max	
5	Gain at Zenith	+1.0 dBic typ.	
6	Gain at 10°elevation	-3.0 dBic typ.	
7	Axial Ratio	4.0 dB max	
8	Polarization	RHCP	
9	Impedance	50 Ohms	
10	Frequency Temperature Coefficient (rf)	0 ± 20ppm / °C	-40°C to +85°C
11	Operating Temperature	-40°C to +85°C	

****Changes in user groundplane and environment will offset centre frequency**

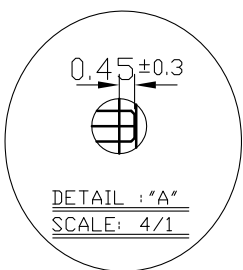
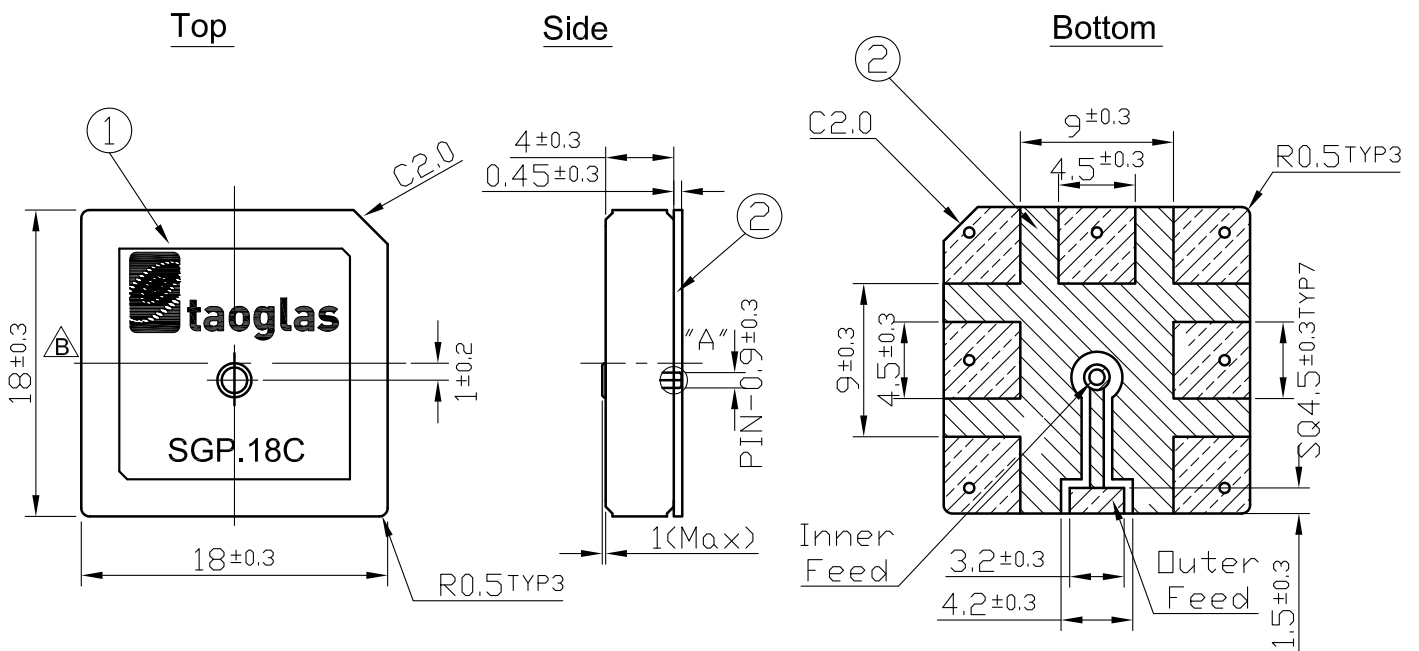
3. Electrical Specifications

3.1 Return Loss, SWR, Impedance, measured on the test fixture





4. Mechanical Specifications

4.1 Antenna Dimensions and Drawing



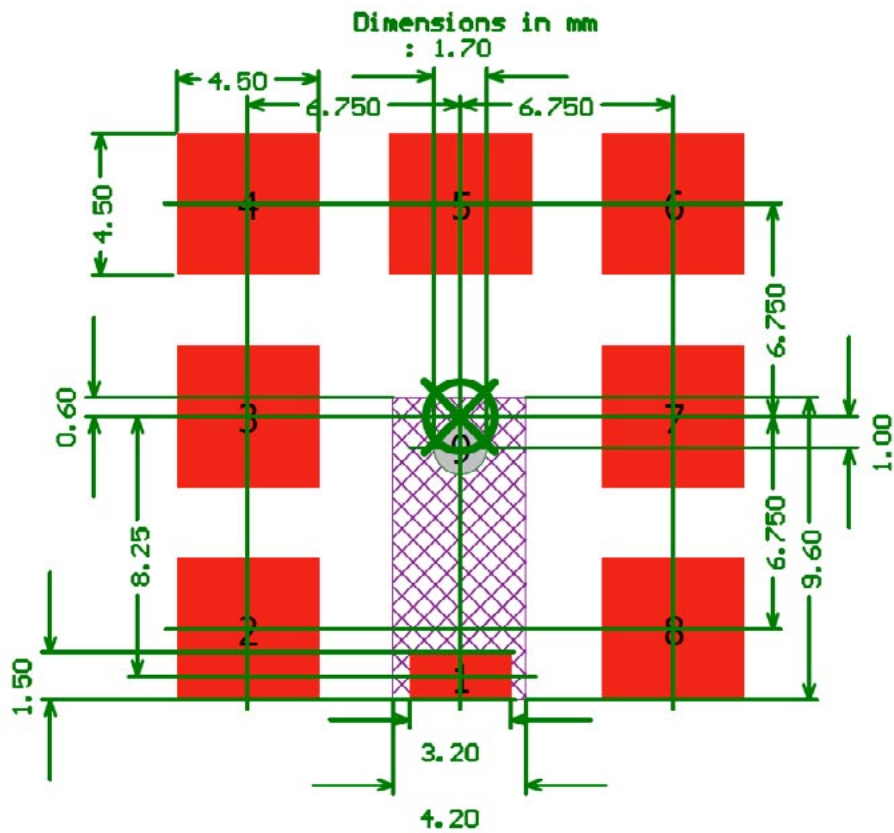
NOTE:

1. Solder mask. 
2. Area to be soldered. 
3. Dimension of 50 Ohm CPW dependent on individual board.
4. Matching circuit-capacitor and inductor values dependent on individual environment
5. Must be soldered to complete antenna feed connection

	Name	Part No.	Material	Finish	Quantity
1	SGP.18 Patch 18x18x4	SGP.18c	Ceramic	Clear	1
2	SGP.18 PCB		FR 0.5t	Green	1

4.2 Antenna Footprint

4.2.1 Top Copper

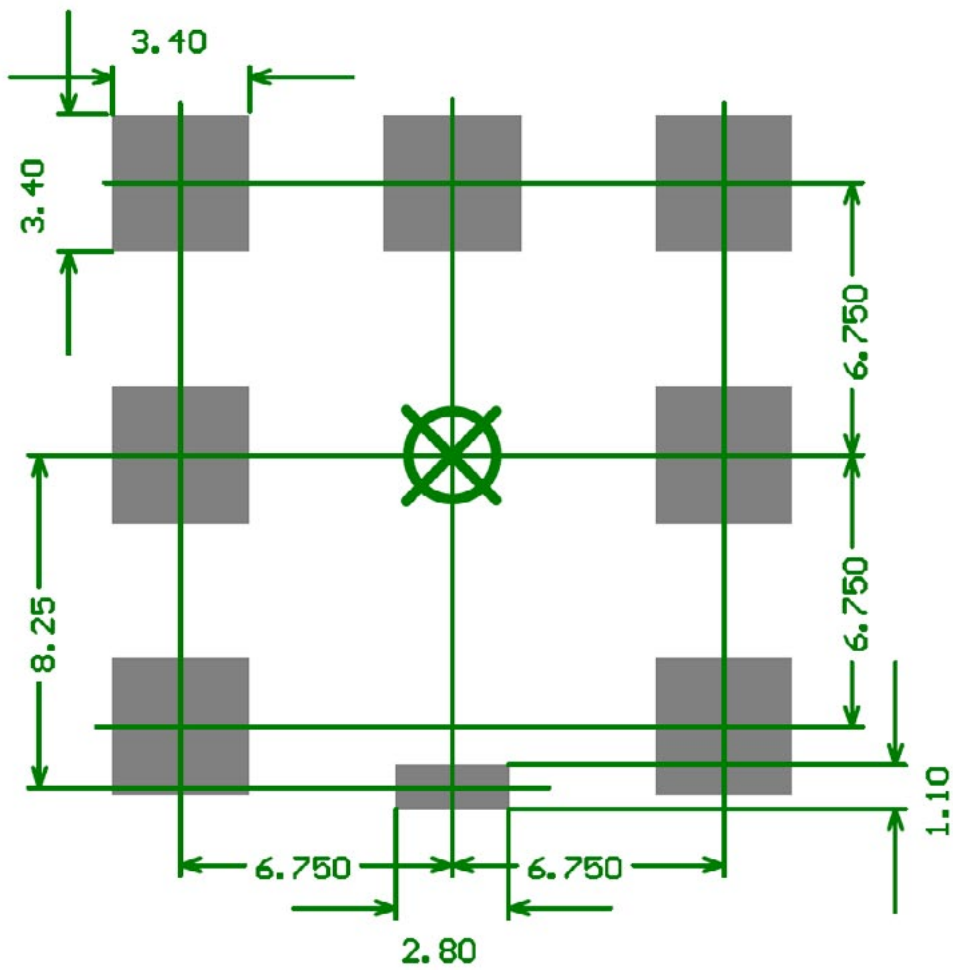


 **Copper Keepout Region**

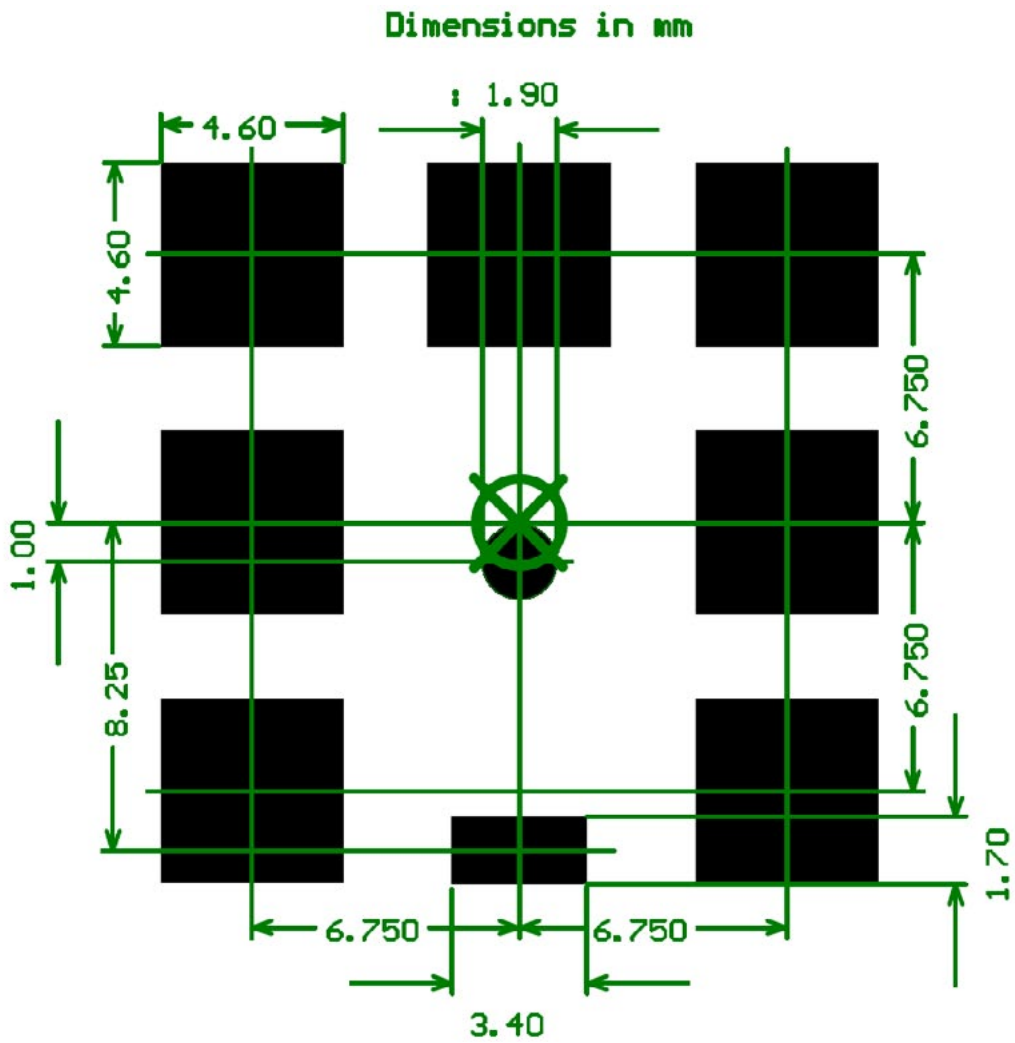
Pads 2, 3, 4, 5, 6, 7, 8 are the same size and should be connected to GND.
 Pad 9 is a 1.70mm dia. non-plated thru-hole.
 Connect 50 ohm transmission line to Pad 1.
 Copper Keepout Region should extend at least 2 mm down into PCB.

4.2.2 Top Paste

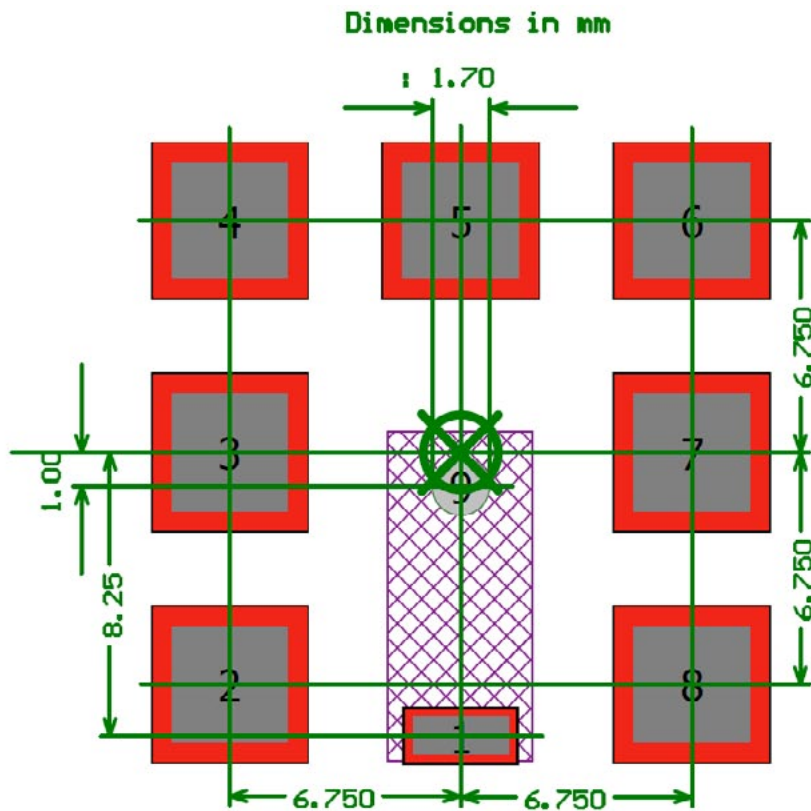
Dimensions in mm



4.2.3 Top Paste



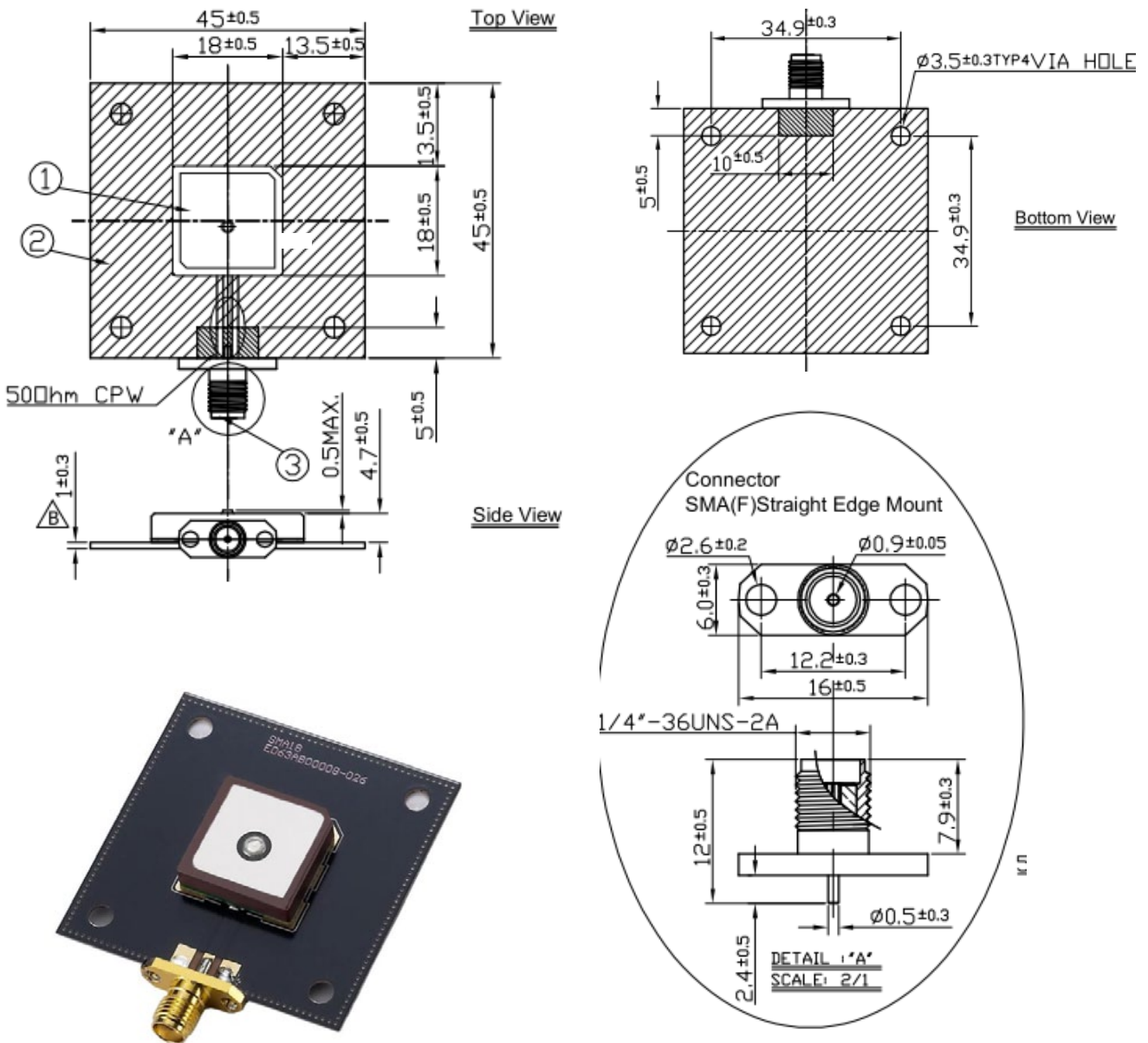
4.2.4 Composite





 **Copper Keepout Region**

Pads 2, 3, 4, 5, 6, 7, 8 are the same size and should be connected to GND.
 Pad 9 is a 1.70mm dia. non-plated thru-hole.
 Connect 50 ohm transmission line to Pad 1.
 Copper Keepout Region should extend at least 2 mm down into PCB.

4.3 Test Jig and Dimension



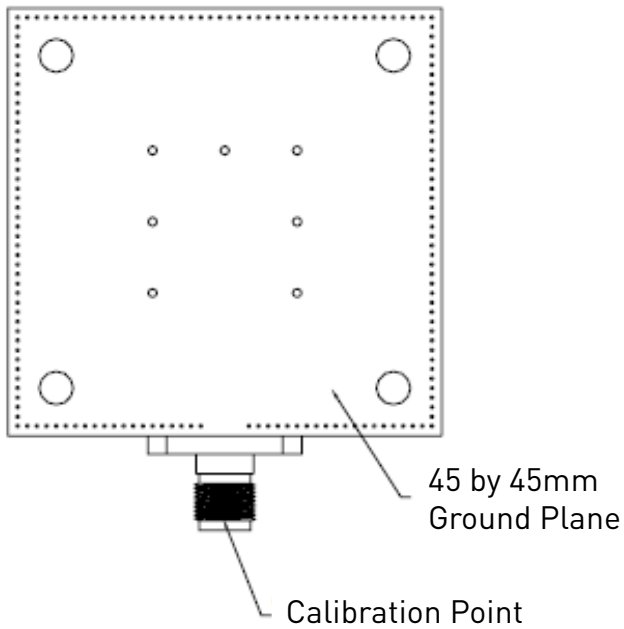
NOTE:

- 1. Solder Mask (Black) 
- 2. Solder Area 

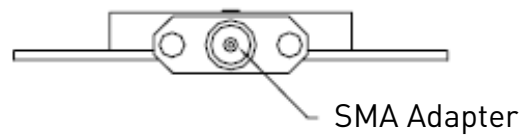
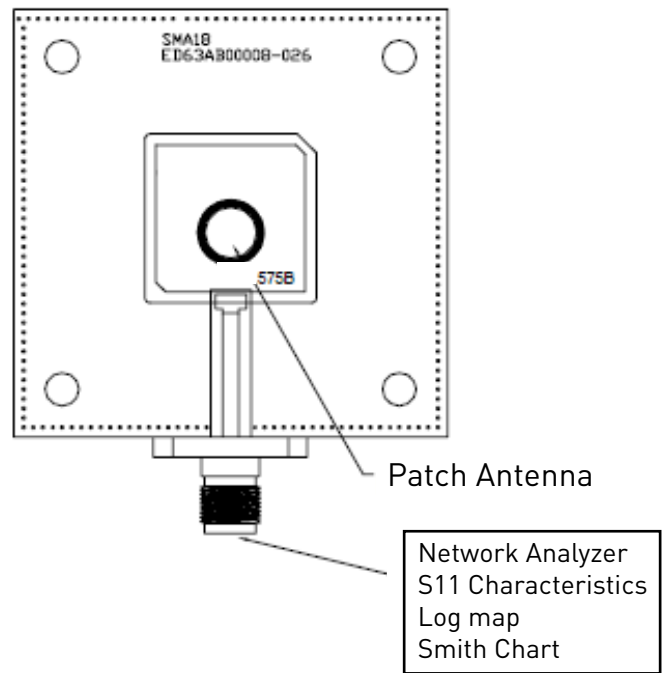
	Name	P/N	Material	Finish	Qty
1	SGP.18 Patch 18x18x4	SGP.18c	Ceramic	Clear	1
2	FR4 PCB		FR4 1t	Black	1
3	SMA(F)Straight Edge Mount	SMA.F.ST.JACK.PANELM.2H.CM	Brass	Gold	1

4.4 Test Fixture set up and measurements

Test Fixture



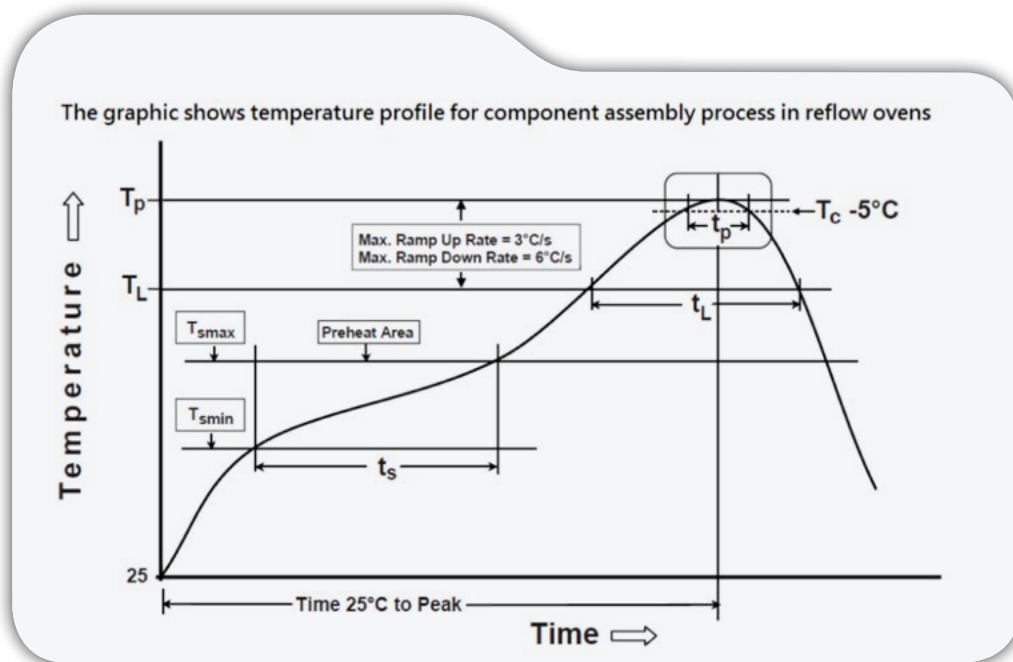
Antenna Setup
& Measurements



5. Recommended Reflow Soldering Profile

SGP.18.C can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follow:

PHASE	PROFILE FEATURES	Pb-Free Assembly (SnAgCu)
PREHEAT	Temperature Min(T_{smin})	150°C
	Temperature Max(T_{smax})	200°C
	Time(t_s) from (T_{smin} to T_{smax})	60-120 seconds
RAMP-UP	Avg. Ramp-up Rate (T_{smax} to TP)	3°C/second(max)
REFLOW	Temperature(T_L)	217°C
	Total Time above T_L (t_L)	30-100 seconds
PEAK	Temperature(T_P)	260°C
	Time(t_p)	2-5 seconds
RAMP-DOWN	Rate	3°C/second(max)
Time from 25°C to Peak Temperature		8 minutes max.
Composition of solder paste		96.5Sn/3Ag/0.5Cu
Solder Paste Model		SHENMAO PF606-P26

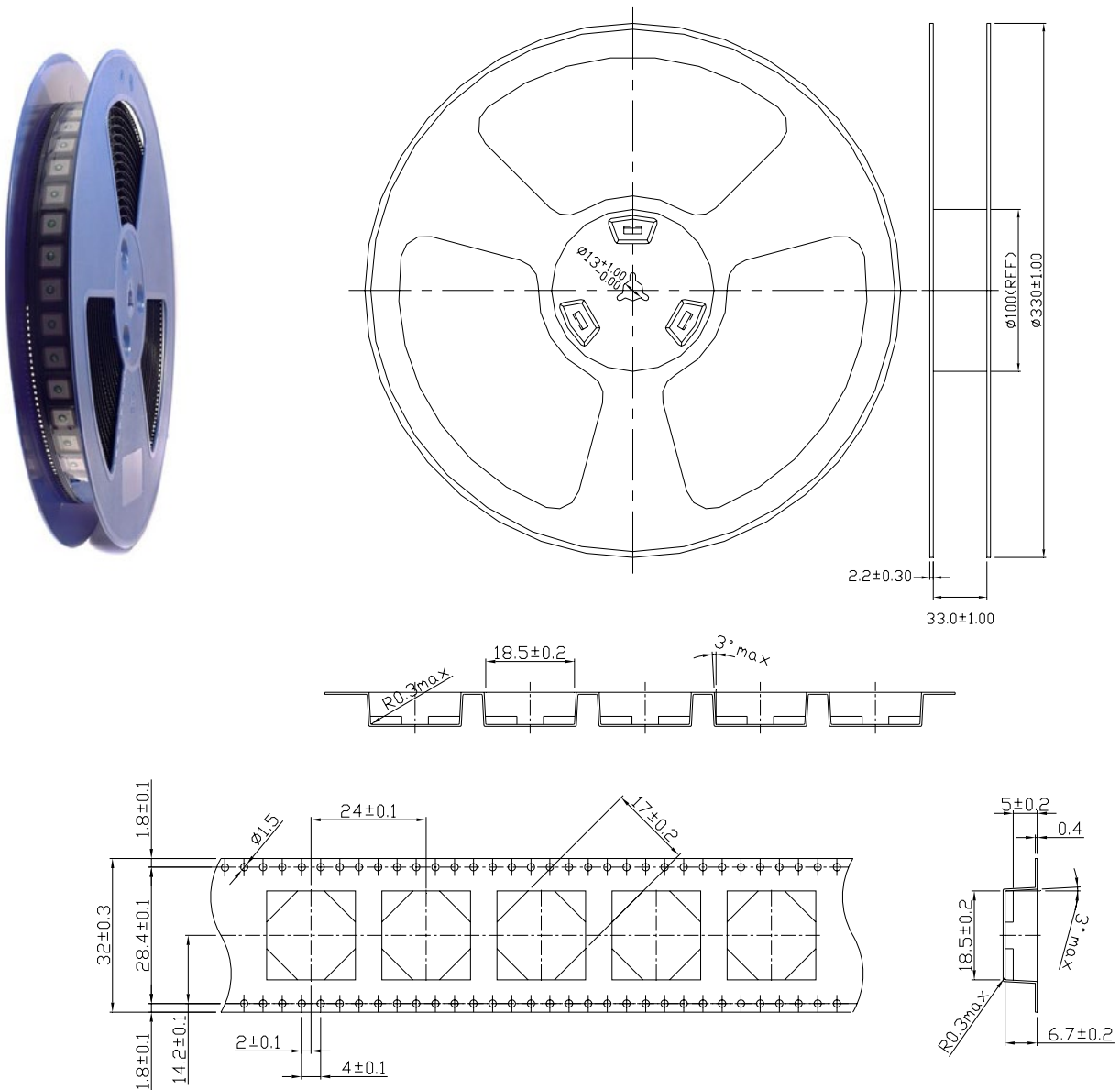


Soldering Iron condition: Soldering iron temperature $270^{\circ}\text{C} \pm 10^{\circ}\text{C}$.

Apply preheating at 120°C for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron temperature over $270^{\circ}\text{C} \pm 10^{\circ}\text{C}$ or 3 seconds, it will make cause component surface peeling or damage.

6. Packaging

200 pcs per reel / inner carton
5 reels per outer carton - 1,000 pcs



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